

NOTE

On Intraspecific Variation in the Alysiinae
(Hymenoptera: Braconidae)

There are few studies published that examine intraspecific variation of the alysiines. Thus, Wharton (1980), in his review of the nearctic alysiines, states: "A general disregard for intraspecific variation has characterized much of the recent taxonomic work on the Alysiini. This has not only created a misleading impression of diversity and biogeographic relationships, but also resulted in problems in identification." He then continues with a detailed analysis of this problem and concludes with: "The studies on intraspecific variation suggest that new species should not be described on the basis of minor morphological differences unless these are supported by biological information." It is therefore interesting to make an in-depth study of the intraspecific variability of the taxonomic characters of morphological type, such as the absolute or relative measurements of certain parts of the body, in order to elucidate to what extent these data are of diagnostic value. The present article addresses this question.

For this study, the Dacnusiini species *Dacnusa sibirica* Telenga, 1934, was selected

because it is common in the study area and because it is easy to breed in the laboratory.

Materials and Methods.—Measurements were made of 195 specimens (75 ♂ and 120 ♀) of *Dacnusa sibirica*, obtained from three species of Agromyzids [*Chromatomyia horticola* (Goureau, 1851); *Liriomyza sonchi* Rydén, 1951 and *Liriomyza strigata* (Meigen, 1830)], on four species of plants [*Cardaria draba* L. (Desv.), *Diplotaxis eruroides* (L.) DC.; *Eryngium maritimum* L. and *Papaver rhoeas* (L.)], collected at four localities [(Lérida: Viella (31TCH1930); Teruel: Alcalá de la Selva (30TXK9472); Valencia: Albalat de la Ribera (30SYJ2876), Cullera (30SYJ3738)].

The characters treated (= measurement magnitudes; measurement characters) correspond with those most commonly used—see Griffiths (1964)—such as: width and length of the head (AC, LC), length and width of thorax (LT, AT), and length and width of the petiole (LP, AP), which are used for calculating the indices: AC/LC, LT/AT and LP/AP. The simple allometric equation ($y = a \cdot x^b$) was used for the study of the

Table I.

Allometric equation: AC = a.LC ^b (see graph 1)							
Sex	a	b	r	F	g.l.	F'	g.l.
Males	1.312	0.533*	0.671	39.243	1,73		
Females	0.269	0.761	0.652	2.805	1,118	81.579	2,191
Allometric equation: LT = a.AT ^b (see graph 2)							
Sex	a	b	r	F	g.l.	F'	g.l.
Males	0.456	0.854*	0.819	6.596	1,73		
Females	-1.143	1.220	0.892	2.849	1,118	26.943	2,191
Allometric equation: LP = a.AP ^b (see graph 3)							
Sex	a	b	r	F	g.l.	F'	g.l.
Males	0.377	0.819*	0.908	16.481	1,73		
Females	0.058	0.907*	0.935	13.290	1,118	81.251	2,191

joint variation of the magnitudes considered.

The measurements were taken using a micrometric eyepiece with a margin of error of 0.0072 mm, fitted to an Olympus szh binocular microscope.

Results.—Table 1 gives the results of the bivariate analysis of the magnitudes AC, LC, LT, AT, LP and AP, involved in the calculation of the indices AC/LC, LT/AT and LP/AP.

Allometric equations for the three pairs of variables involved in calculating the indices: AL/LC, AT/LT and LP/AP (r being the correlation coefficient; F being the statistic (= statistical parameter) distributed as a Snedecor F variable, which allows one to distinguish between allometric ($b = 1$) and isometric growth ($b = 1$); F' being the statistic (statistical parameter) distributed as a Snedecor F variable, which allows the significant acceptance or rejection of the superposition of two given regression lines (De Renzi and Martinelli 1979).

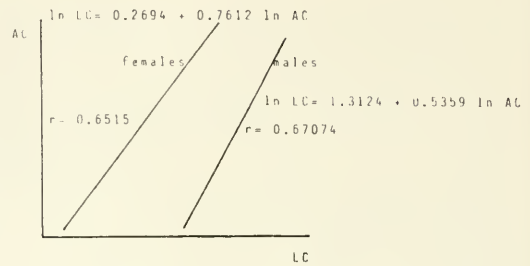
In four of the equations obtained (marked with an asterisk) the allometric coefficient (b) is significantly higher or lower than 1 ($F > F_{0.025}$).

The hypothesis of the superposition of the regression lines, for each sex, can be rejected in all cases, with an optimum level of significance, $\alpha = 0.01$, $F' > F_{0.001}(2, n + n' - 4)$.

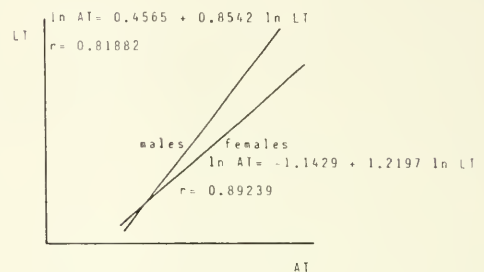
Discussion.—In taxonomic studies of members of the Braconidae, as in other groups from the series Parasitica, ratios between measurements are frequently used as diagnostic characters.

For some time now, the authors have observed certain individual, interpopulational and even intrapopulational variation in certain measurements and we thus think that the joint variation of these measurements does not allow a specific value to be given to the respective ratios.

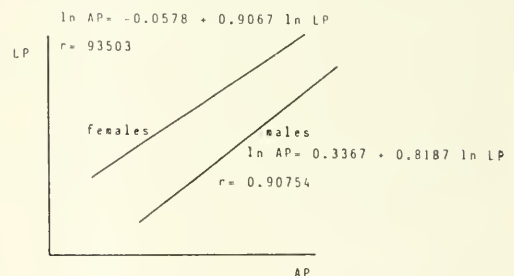
The results obtained confirm secondary sexual characteristics in the relative increase of corporal measurements, in the three cor-



graph 1



graph 2



graph 3

poral indices examined (AC/LC, AT/LT and LP/AP). The equations obtained give allometric coefficients (b) higher or lower than 1, thus producing an increase or decrease in the value of the indices in accordance with the corporal measurements.

These results are unfavourable for the use of indices of measurements in either keys or as basic diagnostic characters.

Acknowledgments.—We wish to thank Dr. Griffiths (University of Alberta, Department of Entomology), Dr. Godfray (Imperial College, London) and Dr. Wharton (Texas A&M University, Department of Entomology) for their observations and critical reading of the manuscript.

LITERATURE CITED

- De Renzi, M. and J. Martinelli 1979. Algunos aspectos de la problemática de la especie paleontológica: Aplicación al caso de la diferenciación biométrica de *Nassarius semistriatus* (Brocchi, 1814) y *N. elatus* (Gould, 1845). *Studia Geológica*, XV: 7-36.
- Griffiths, G. C. D. 1964. The Alysiinae (Hym., Braconidae) parasites of the Agromyzidae (Diptera). I. General questions of taxonomy, biology and evolution. *Beitr. Entomol.*, 14: 823-914.
- Wharton, R. 1980. Review of the Nearctic Alysiini (Hym., Braconidae), with discussion of generic relationships within the tribe. *Univ. Calif. Publ. Ent.*, 88: 112 pp.
- J. Tormos and S. F. Gayubo, *Departamento de Biología Animal, Ecología, Edafología, Parasitología y Química Agrícola, Facultad de Biología, Universidad de Salamanca, 37071-Salamanca, España*; J. D. Asís and A. Sendra, *Fundación Entomológica "Juan de Torres Sala," Passeig de la Petxina, nº 15, 46008-València, España.*